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(54) **Removable Floor Covering Structure**

(57) For the sake of a rapid removal with significantly less nuisance from noise and dirt than was previously the case, a floor covering structure for a supporting substructure with a hard wear layer bonded to it is provided with a hard wear covering, which is bonded to an intermediary layer made of compression- and tear-resistant material, which is bonded to the hard wear layer in an at least partially detachable manner. The intermediary layer is preferably comprised of flat elements with a thickness of approx. 0.1 – approx. 1.5 mm, which are comprised of rot-resistant fibers or fiber mixtures.

### Removable Floor Covering Structure

The invention relates to a floor covering structure for a supporting substructure with a hard wear layer bonded to it, which is comprised, for example, of floor pavement, concrete, parquet, PVC, linoleum, ceramic, tiles, terrazzo, or natural and synthetic stone slabs, etc..

In many rental apartments, when the rental relationship is terminated, the tenant is contractually obligated to return the rental apartment to its original condition. There was not much incentive to create an individual look for the rental apartment, with a different hard floor covering or wall covering tailored to the tastes of the tenant, e.g. a covering made of ceramic tiles, mosaic, synthetic or natural stone slabs, or of a homogeneous or heterogeneous covering bonded with reaction resin, because returning the apartment to its original state required a lot of time and involved high costs. Namely, hard coverings are usually bonded to the substructure by means of mortar or adhesives so firmly that they can only be removed by hammer and chisel, creating considerable quantities of dirt and dust and almost always producing a completely torn up, uneven substructure, which must then be completely restored.

Also, during interior renovation of old buildings, there is frequently a desire to produce – as quickly as possible and without significant nuisance from noise and dirt – a solid look that fulfills the requirements of individual tastes by means of hard wear coverings that can be changed in a particular renovation cycle.

The object of the invention is to provide a hard floor covering structure of the type mentioned at the beginning, which can be quickly removed with significantly less nuisance from noise and dirt than was previously possible.

According to the invention, this object is attained by the features disclosed in claim 1. The dependent claims contain preferred features that advantageously modify the invention.

The embodiment according to the invention advantageously provides a hard floor covering structure, which can still be quickly, cleanly, and inexpensively returned to the original condition even after years have passed and can be used in the same way for covering a wall. This favorably allows for the possibility of considerably shortening renovation cycles, where downtimes during which the property cannot be used as well as nuisances due to noise and dirt are kept to a minimum and therefore become tolerable. Even after years have passed, the use of an intermediary layer permits a simple removal or "peeling away" of wear coverings made of hard, inflexible materials to be executed, such as ceramic tiles, mosaics, synthetic or natural stone slabs, as well as homogeneous or heterogeneous coverings bonded with reaction resin. With the use of a removable adhesive, the invention advantageously permits a return to the original state without residues of the hard wear covering being left behind. The ease of renovation and restoration of the floor- or wall covering structure according to the invention consequently significantly increases the willingness to carry out reversible measures for apartment beautification.

The intermediary layer provided is preferably comprised of flat elements in the form of a flat structure made of rot-resistant natural or synthetic fibers or fiber mixtures, which are preferably comprised of polypropylene, polyamide, polyester, and similar plastics. Alternatively, the intermediary layer is preferably comprised of a nonwoven, which is impregnated, saturated, filled, hardened, or condensed with a filler-containing or filler-free synthetic resin binding agent. The flat elements are advantageously embodied in the form of sheets or blanks and due to their

compression resistance and slight thickness, cannot be compressed to any appreciable degree. They are economically comprised of a nonwoven, preferably of a spun nonwoven, which is bonded thermally or by means of a binding agent.

The flat elements are favorably coated in a self-adhesive fashion on one side, with a contact adhesive, which is applied over the entire surface, over part of the surface, in points, in strips, or the like. This contact adhesive layer permits the intermediary layer to be detachably bonded to the provided hard wear layer of the floor; when the hard wear covering is removed, the intermediary layer comes apart in such a way that after the complete removal of the hard wear covering, the originally supporting substructure remains, with an essentially smooth part of the intermediary layer still glued to it. The contact adhesive can be based on caoutchouc, EVA copolymer, polyacrylate, or the like, and is applied to the flat structure in the form of a hot-melt-type adhesive, a solution, or a dispersion. The weight of the adhesive application when dry is preferably in the range of 30 – 150 g/m<sup>2</sup>.

On the other hand, the flat elements can also be non-self-adhesive, to be bonded by means of a commercially available textile coating adhesive, such as a textile floor covering, or by means of easily removable coating adhesives or fixing agents applied to the supporting substructure in the conventional manner, e.g. by means of spatulas, rollers, sprays, or the like.

The thickness of the intermediary layer is approximately 0.1 – 1.5 mm, preferably 0.3 – 1.0 mm. The weight of the intermediary layer lies in a range from 30 – 1500 g/m<sup>2</sup>, preferably between 50 and 100 g/m<sup>2</sup>.

The tear resistance of the intermediary layer, which is important for the removal process, lies between 0.5 and 25 N/mm<sup>2</sup>, preferably between 3 and 15 N/mm<sup>2</sup>. The breaking elongation lies in a range between approximately 10 and 200%, preferably between 20 and 50%, while the tear propagation resistance is approximately 15 – 150 N, preferably 20 to 50.

According to a preferred modification of the invention, the flat elements have at least one structured surface for producing an adhesion texture in order to assure the firm connection of the floor covering structure. The intermediary layer made up of the flat elements is preferably dimensionally stable under the influence of moisture and instead of being bonded by means of at least partial gluing, can also be fastened to the existing floor by means of clamps and the like.

A non-flexible hard wear covering is then mounted in the usual way to the bonded intermediary layer by means of a conventional installation technique, for example by means of the thin-bed, medium-bed, or thick-bed method, by means of hydraulic installation or joining mortar, or the use of thin-bed adhesives. This hard wear covering is comprised of ceramic tiles, mosaic, synthetic or natural stone slabs, or alternatively of a homogeneous or heterogeneous covering bonded with reaction resin, for example a hard, granular material that is bonded with polyurethane or epoxy resin, where the reaction resin bonding agent simultaneously produces the attachment to the intermediary layer.

The accompanying Figs. 1 and 2 each show an exemplary embodiment of a hard floor covering structure 10, 10' according to the invention, which is mounted on a supporting substructure 11 with a hard floor wear layer 12. The wear layer 12 is comprised, for example, of floor pavement, concrete, parquet, PVC, linoleum, ceramic tiles, terazzo, natural and synthetic stone slabs. The wear layer 12 is bonded in an easily detachable manner to an intermediary layer 14, which is comprised of sheet-shaped, flat elements, by means of an adhesive layer 15, which is shown enlarged, using a so-called removable adhesive or a fixing agent. In the exemplary

embodiments shown, the thickness of the intermediary layer 14 is approx. 1.0 mm and is shown enlarged in relation to the other structural elements in order to clarify its depiction. The intermediary layer 14 is comprised of a spun nonwoven, but could just as well be made of a cloth, a knit, other nonwoven, or paper.

A hard wear covering 16 or 21 is mounted onto the intermediary layer 14 and in the example shown in Fig. 1, is comprised of individual ceramic tiles 18, which are separated from each other by means of mortar guides 19 and are bonded to the intermediary layer 14 in a mortar bed 20. Fig. 2 shows a heterogeneous covering 21, which is bonded with reaction resin, as a wear covering, which has hard, granular material that is bonded by means of an epoxy resin, where the epoxy resin simultaneously bonds the covering 21 to the intermediary layer 14.

In order to remove the hard wear covering 16, it is only necessary to lift away the wear covering 16 in the edge region of the room except for the intermediary layer 14 and then separate the hard wear covering from the hard wear layer 12 along the intermediary layer 14. Depending on the type of intermediary layer used and the type of adhesive used, during the separation, a tearing can occur in the vicinity of the intermediary layer and/or in the vicinity of the adhesive. If a water-soluble adhesive or a so-called fixing agent has been used, then remaining pieces of intermediary layer and/or adhesive residues can be easily and quickly removed in order to restore the floor to its original state. In any case, after the removal of the applied hard wear covering, a floor surface always remains, which does not have to be freed of hard covering remainders and to which a separating- or intermediary layer 14 can be re-applied immediately and a new wear covering 16 can be mounted onto it.

The floor covering structure according to the invention is consequently easy to renovate and restore and thus for the floor as well as for the wall region, offers the possibility of producing individual hard coverings, which can be quickly and easily removed again with a low degree of nuisance from noise and dirt. As a result, the floor covering structure according to the invention is of considerable significance not only for restoring the original state of hard floors or substructures in rental properties, but also simultaneously permits more frequent renovation, without the previously customary nuisances due to noise and dirt, and permits downtimes during which the property cannot be used to remain short. The operation when installing and removing the floor or wall covering structure according to the invention is therefore so trouble-free that it can also be easily done by inexperienced people.

### Claims

1. A floor covering structure for a supporting substructure (11) with a hard wear layer (12) attached to it, characterized by means of a hard wear covering (16), which is bonded to an intermediary layer (14) made of a compression- and tear-resistant material, which is at least partially detachably bonded to the hard wear layer (12).

2. The structure according to claim 1, characterized in that the intermediary layer (14) is comprised of flat elements, which are made of rot-resistant fibers or fiber mixtures.

3. The structure according to claim 1 or 2, characterized in that the intermediary layer (14) is comprised of a nonwoven, which is impregnated, saturated, filled, hardened, or condensed with a filler-containing or filler-free synthetic resin binding agent.

4. The structure according to claim 1 or 2, characterized in that the intermediary layer (14) is comprised of a nonwoven, in particular a spun nonwoven, which is bonded thermally or by means of a binding agent.

5. The structure according to one of the preceding claims, characterized in that the intermediary layer (14) is detachably glued (15) to the hard wear layer (12).

6. The structure according to one of the preceding claims, characterized in that the intermediary layer (14) has a thickness of approx. 0.1 to approx. 1.5 mm.

7. The structure according to one of the preceding claims, characterized in that the intermediary layer (14) has a tear resistance of approx. 0.5 to approx. 25 N/mm<sup>2</sup>.

8. The structure according to one of the preceding claims, characterized in that the intermediary layer (14) has a breaking elongation of approx. 10 to approx. 200% and a tear propagation resistance of approximately 15 – 150 N.

9. The structure according to one of the preceding claims, characterized in that the intermediary layer (14) has at least one structured surface.

10. The structure according to claim 5, characterized in that the intermediary layer (14) is coated on one side in a self-adhesive manner with contact adhesive over at least a part of its surface area.

11. A process for producing a floor covering structure for a supporting substructure, with a hard wear layer attached to it, characterized in that plate- or sheet-shaped elements are made of a compression- and tear-resistant material, that the elements are detachably bonded to the hard wear layer as a closed intermediary layer, and that the hard wear covering is mounted to this intermediary layer in an intrinsically known manner.

12. The process according to claim 11, characterized in that the flat elements of the intermediary layer are made out of rot-resistant fibers or fiber mixtures.

13. The process according to claim 11 or 12, characterized in that the intermediary layer is bonded to the hard wear layer by means of a detachable adhesive connection, at least over a part of its surface area.

14. The process according to one of claims 11 to 13, characterized in that during manufacture, the elements are coated on one side, at least over a part of their surface area, with a contact adhesive.

15. The process according to one of claims 11 to 13, characterized in that the elements of the intermediary layer are glued in a known manner to the hard wear layer, at least over a part of their surface area, with an easily removable covering adhesive.

16. The process according to claim 11 or 12, characterized in that the elements of the intermediary layer are bonded to the hard wear layer by means of nails, clamps, or the like.

17. The process according to one of claims 11 to 16, characterized in that the hard wear covering on the intermediary layer is made of ceramic tiles, mosaic, or synthetic or natural stone slabs.

18. The process according to one of claims 11 to 16, characterized in that the hard wear covering on the intermediary layer is made of a covering bonded with reaction resin.